REMARKS

Claims 76-83 are pending in this application.

Claims 76-80, 82 and 83 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hasegawa et al. (U.S. Patent No. 6,593,246) ("Hasegawa"). This rejection is respectfully traversed.

The claimed invention relates to an "integrated circuit structure." As such, independent claim 76 recites an "integrated circuit structure" comprising *inter alia* "a first insulating layer comprising SILK material with a dielectric constant of about 2.65 at 100 kHz provided over a semiconductor substrate and contacting at least a portion of a metal layer provided within said semiconductor substrate, said first insulating layer having a thickness of about 4,000 Angstroms to about 30,000 Angstroms." Independent claim 76 also recites "a second insulating layer comprising NANOGLASS material with a dielectric constant of about 3.5 at 100 kHz provided over said first insulating layer, said second insulating layer having a thickness of about 100 Angstroms to about 2,000 Angstroms." Independent claim 76 further recites "at least a first opening within said first and second insulating layers, said first opening being formed by time etching of at least one of said first and second insulating layers with a first etch chemistry."

Hasegawa discloses a "process for producing a semiconductor device comprising an inter level dielectric containing a xerogel film or a fluorine resin film." (Abstract). The process of Hasegawa comprises "a step of forming, on the inter level dielectric comprising a lower layer of the inter level dielectric formed with an organic film and an upper layer of the inter level dielectric formed with a xerogel film or a fluorine resin film, a first mask to be an etching mask for forming a via contact hole by etching the inter level dielectric." (Abstract). The process of Hasegawa further

comprises "a step of forming, on the first mask, a second mask, which comprises a different material from the first mask, to be an etching mask for forming a wiring groove by etching the inter level dielectric." (Abstract).

The subject matter of claims 76-80, 82 and 83 would not have been obvious over Hasegawa. Specifically, the Office Action fails to establish a *prima facie* case of obviousness. Courts have generally recognized that a showing of a *prima facie* case of obviousness necessitates three requirements: (i) some suggestion or motivation, either in the references themselves or in the knowledge of a person of ordinary skill in the art, to modify the reference or combine the reference teachings; (ii) a reasonable expectation of success; and (iii) the prior art references must teach or suggest all claim limitations. See e.g., In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999); In re Rouffet, 149 F.3d 1350, 1355 (Fed. Cir. 1998); Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573 (Fed. Cir. 1996).

In the present case, Hasegawa fails to disclose, teach or suggest all limitations of independent claim 76. Hasegawa is silent about "a first insulating layer comprising SILK material . . . having a thickness of about 4,000 Angstroms to about 30,000 Angstroms" and "a second insulating layer comprising NANOGLASS material . . . having a thickness of about 100 Angstroms to about 2,000 Angstroms," as independent claim 76 recites. Hasegawa teaches that the second film 14 having a low dielectric constant (which would arguably correspond to the "second insulating layer comprising NANOGLASS material" of the claimed invention) has a thickness of 400 nm (which is 4,000 Angstroms) and not "about 100 Angstroms to about 2,000 Angstroms," as in the claimed invention.

Applicant notes that the "second insulating layer comprising NANOGLASS material" of the claimed invention has a thickness that allows it to be employed during a timed etch process. The specification of the present application specifically emphasizes that "[a]fter the formation of trenches 65 through the first intermetal insulating layer 55 and the removal of the first photoresist layer 58," "via patterns 63 are then etched by employing a timed etch into the second intermetal insulating layer 57 to form vias 56 (Figure 11)." (Application at 13, lines 6-12). Thus, a person of ordinary skill in the art would not have been motivated to use the second film 14 of Hasegawa with a thickness of 400 nm (or 4,000 Angstroms) *in lieu* of the "second insulating layer comprising NANOGLASS material . . . having a thickness of about 100 Angstroms to about 2,000 Angstroms" of the claimed invention, as the thickness of the "second insulating layer" is critical for the times etch process of the claimed invention. For at least these reasons, the Office Action fails to establish a *prima facie* case of obviousness, and withdrawal of the rejection of claims 76-80, 82 and 83 is respectfully requested.

Claim 81 stands rejected under 35 U.S.C. § 103 as being unpatentable over Hasegawa in view of Baklanov et al. (U.S. Patent No. 6,593,251) ("Baklanov"). This rejection is respectfully traversed.

Claim 81 depends on amended independent claim 76 and recites that the fourth insulating layer "comprises SILK material with a dielectric constant of about 2.65 at 100 kHz" and that the third insulating layer "comprises NANOGLASS material with a dielectric constant of about 3.5 at 100 kHz."

Baklanov relates to "a method to produce a porous oxygen-silicon insulating layer comprising following steps: applying a silicon oxygen layer to a substrate exposing the said substrate to a HF ambient." (Abstract).

The subject matter of claim 81 would not have been obvious over Hasegawa in view of Baklanov. Again, the Office Action fails to establish a *prima facie* case of obviousness. First, not all limitations of independent claim 76 are disclosed, taught or suggested by the prior art references, whether considered alone or in combination. None of Hasegawa and Baklanov, considered alone or in combination, discloses, teaches or suggests an "integrated circuit structure" comprising "a first insulating layer comprising SILK material with a dielectric constant of about 2.65 at 100 kHz . . . having a thickness of about 4,000 Angstroms to about 30,000 Angstroms" and "a second insulating layer comprising NANOGLASS material with a dielectric constant of about 3.5 at 100 kHz . . . having a thickness of about 100 Angstroms to about 2,000 Angstroms," much less a third and fourth insulating layers provided over the first and second insulating layers so that the fourth insulating layer "comprises SILK material with a dielectric constant of about 2.65 at 100 kHz" and the third insulating layer "comprises NANOGLASS material with a dielectric constant of about 3.5 at 100 kHz," as in the claimed invention.

As noted above, Hasegawa is silent about all limitations of amended independent claim 76. In addition, Hasegawa fails to disclose, teach or suggest an integrated circuit structure having a third and fourth insulating layers provided over a first and second insulating layers, as in the claimed invention. Further, Baklanov is silent about an "integrated circuit structure" having a plurality of insulating layers which are selected based on the compatibility of specific materials having specific thicknesses. Baklanov is silent about "a first insulating layer comprising SILK material

with a dielectric constant of about 2.65 at 100 kHz . . . having a thickness of about 4,000 Angstroms to about 30,000 Angstroms" and "a second insulating layer comprising NANOGLASS material with a dielectric constant of about 3.5 at 100 kHz . . . having a thickness of about 100 Angstroms to about 2,000 Angstroms," much less about a third and fourth insulating layers provided over the first and second insulating layers so that the fourth insulating layer "comprises SILK material with a dielectric constant of about 2.65 at 100 kHz" and the third insulating layer "comprises NANOGLASS material with a dielectric constant of about 3.5 at 100 kHz," as in the claimed invention.

Second, a person of ordinary skill in the art would not have been motivated to combine the teachings of Hasegawa with those of Baklanov to arrive at the claimed invention. Applicant submits that, to establish a *prima facie* case of obviousness, "[i]t is insufficient that the prior art disclosed the components of the patented device, either separately or used in other combinations; there must be some teaching, suggestion, or incentive to make the combination made by the inventor." Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934 (Fed. Cir. 1990). This way, "the inquiry is not whether each element existed in the prior art, but whether the prior art made obvious the invention as a whole for which patentability is claimed." Hartness Int'l, Inc. v. Simplimatic Engineering Co., 819 F.2d 1100, 1108 (Fed. Cir. 1987). Accordingly, a determination of obviousness "must involve more than indiscriminately combining prior art; a motivation or suggestion to combine must exist." Pro-Mold & Tool Co., 75 F.3d at 1573. This way, a rejection of a claim for obviousness in view of a combination of prior art references must be based on a showing of a suggestion, teaching, or motivation that has to be "clear and particular." In re Dembiczak, 175 F.3d at 999. Thus, the mere fact that it is possible to find two isolated disclosures which might be combined to produce a new compound does not necessarily render such production obvious, unless the prior art also suggests the desirability of the proposed combination.

The November 17, 2004 Office Action fails to establish a *prima facie* case of obviousness because, as the Court in Northern Telecom, Inc. noted, "[i]t is insufficient that the prior art disclosed the components of the patented device" and there is no "teaching, suggestion, or incentive to make the combination." Northern Telecom, Inc., 908 F.2d at 934. On one hand, the crux of Hasegawa is the formation of "a xerogel or a fluorine resin in an inter level dielectric to decrease a wiring capacitance." (Abstract). Hasegawa also teaches a first and second mask layers having different materials that form an etching mask. On the other hand, the crux of Baklanov is "to increase the porosity of the CVD Silicon-oxygen film under soft physical and chemical conditions to avoid any change of the chemical composition and of the material properties." (Col. 1, lines 56-58). In this manner, "[t]hese physical and chemical conditions are compatible with the substrates and the layers formed thereon." (Col. 1, lines 58-60). Accordingly, one skilled in the art would not have been motivated to combine these disparate references and, for at least these reasons, the Office Action fails to establish a *prima facie* case of obviousness. Withdrawal of the rejection of claim 81 is also respectfully requested.

Allowance of the application is solicited.

Dated: January 13, 2005

Respectfully submitted,

By _____

Thomas J. D'Amico
Registration No.: 28,371
Gabriela I. Coman
Registration No.: 50,515
DICKSTEIN SHAPIRO MORIN &
OSHINSKY LLP
2101 L Street NW
Washington, DC 20037-1526
(202) 785-9700
Attorneys for Applicant